

the Conservation Resource

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Serving nature and you



Connecting Missourians to Conservation

by Eric Kurzejeski, Outreach Programs Chief

Every Missourian is connected to conservation—what is unique is the way each individual views those connections. In this issue of *The Conservation Resource* we provide you with tools to help your students identify and explore their connections to conservation. Some connections are obvious—I like to feed and watch birds, I enjoy a walk in the woods, I fish and I camp. But many others may not see a place for themselves in these traditional outdoor activities. Nonetheless, each and every one of us is personally affected by natural resource conservation. Helping students develop an appreciation for these connections is vital to ensuring the future of Missouri's fish, wildlife and natural habitats. Ask your students why we need to "save the rainforest"—a place that is thousands of miles from their homes. They've been taught that rain forests are essential to our planet's environmental health. Then ask why we need to conserve Missouri's prairies, wetlands and forests. I hope the parallels would be many.

Missourians want clean water. Missourians want our forests and prairies to serve as filters for the air we breathe. Missourians want protection for our unique natural areas. These living treasures are vital in supporting a wide diversity of plants and animals, many of which are crucial to retaining "balance" within our complex ecological systems. Missourians want their children to have an appreciation of nature. Missourians want well-managed forests, fish and wildlife. Missourians want places in which to take pleasure in nature, to relax and renew their spirits.

As with the rainforest, there is a clear connection between conserving Missouri's fish, wildlife and natural habitats and the quality of life each of us enjoys in our state. Even if you do not venture far from your neighborhood, you enjoy the fall colors of a tree along your route to school, the birds at the feeder in your backyard, or the flower bed that is home to butterflies. These connections to conservation are subtle, but our quality of life would be lessened without them.

Another little-known but critical way we are all connected to conservation is in the many positive economic benefits "good" conservation brings to our state. Almost one-third of tourism-related expenditures in Missouri are associated with outdoor recreation. These activities support over 54,000 Missouri jobs. Deer season alone generates three-quarters of a billion dollars in local expenditures, with a good share of them occurring in the rural areas of our state. The economics of conservation helps our state prosper.

As Missourians, we have much to be proud of. An important source of pride is the fact that other states look to us for conservation leadership. The foundation of this success is simple—the people of Missouri make conservation happen. Each of you, with your own unique connections to conservation, is the key to continued success. The future of conservation in Missouri remains bright. By understanding the values of conservation, each of your students will discover a role to play in leaving future generations with a natural world in even better condition than that which we enjoy today.

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**An entire issue devoted to
Connecting Missourians
to Conservation**

Conservation in Missouri

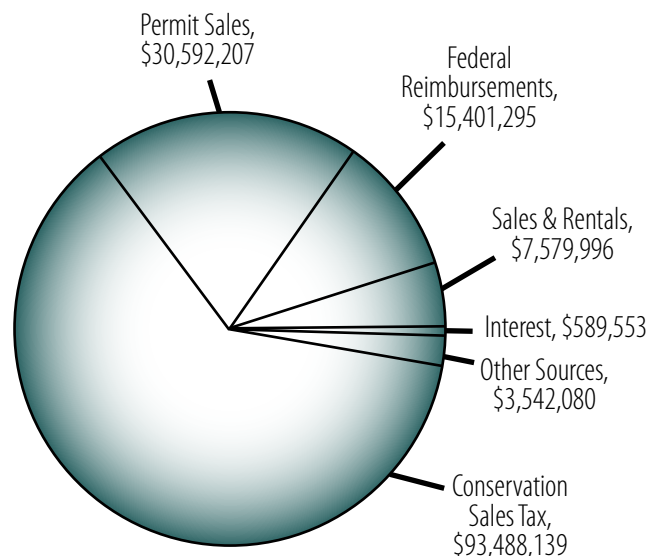
Have you ever wondered how conservation got started in Missouri? In 1935, a group of dedicated and inspired Missouri sportsmen calling themselves the Restoration and Conservation Federation of Missouri, proposed to amend the Missouri constitution to create a conservation agency. Known as Amendment 4, their initiative passed on November 3, 1936, by a margin of 71 percent to 29 percent. This victory was the largest of any constitutional amendment in the state's history. The victory resulted in the creation of the Missouri Department of Conservation.

The charge of this new agency was to restore and protect our wildlife and forests. It was to be governed by a four-member, non-partisan commission appointed by the governor. Each member of the commission would serve six years and terms would be staggered so that not more than two would expire in any four-year state administration. The Missouri Department of Conservation Commission is still appointed under these conditions.

Hunting, fishing and trapping permit fees provided most of the Department's funding for the first 40 years. Then in 1976 Missouri voters passed a one-eighth of one percent sales tax to be earmarked for conservation use. This money has been used to fund the "Design for Conservation" plan, which has allowed the Department to expand programs and public services. This includes the purchase of public land for recreation and forestry and to protect habitats for rare and endangered species.

From the beginning the Missouri Department of Conservation has been working to control, manage, restore, conserve and regulate the fish, forests and wildlife resources of the state. Our goal is to bring people and nature together by creating healthy, sustainable plant and animal communities. A supportive and involved public, consistent funding and a strong political structure have made Missouri a leader in conservation.

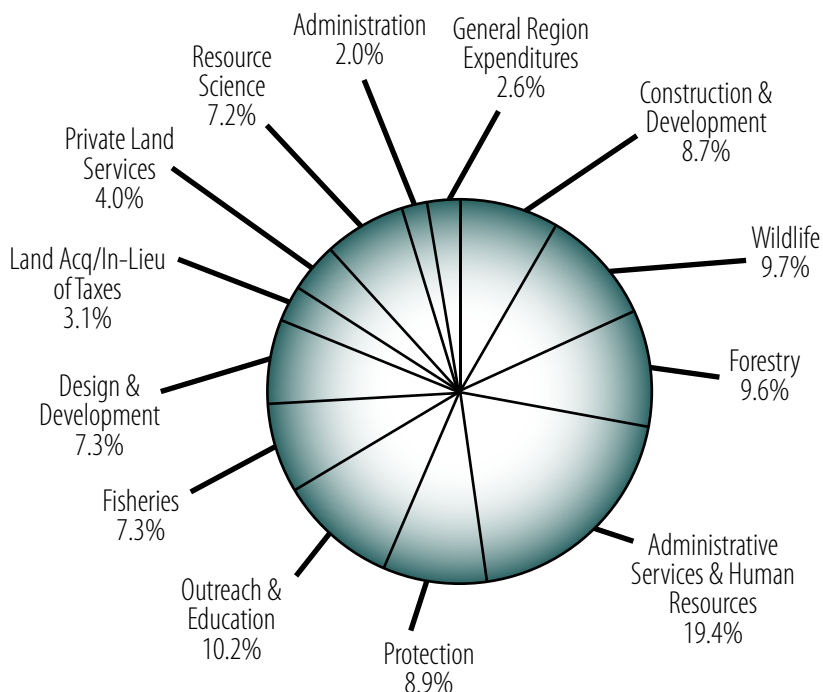
RECEIPTS



Total Receipts \$151,193,269

DISBURSEMENTS

Total Cash Disbursements
\$148,881,005



Healthy Forests

What do Missouri's forests provide its wildlife and citizens? Perhaps more than you would imagine. Forested lands not only provide wildlife habitat and species diversity, they also contribute to water-quality protection and economic stability. Nearly 14 million acres of the state are in some form of forest habitat, and 85 percent of that acreage is in private ownership. Forestry and the wood-using industries in Missouri contribute about \$3 billion annually to the state's economy. In addition, wood-industry firms and activities support more than 34,000 jobs each year.

To continue to reap these benefits, Missourians are challenged with managing forested lands for long-term sustainability. Compounding this challenge is the fact that Missouri's forests are aging and susceptible to a variety of forest-health issues, including oak decline, red oak borer, gypsy moth and other insects and disease outbreaks. Added to the challenge is the lack of technical and financial assistance for the 300,000-plus non-industrial private forest (NIPF) landowners who manage private forests.

To meet these challenges the U.S. Forest Service and Conservation Department have teamed up to inventory and monitor the state's forested lands. Crews of foresters are measuring and counting trees on private, state and federal land. Some crews inventory tree species, size and growth on each of the plots. Other crews measure indicators of forest health, such as crown dieback, insect and disease damage and tree mortality on selected plots. Each year crews measure 20 percent of the 3,500 plots in the state. All plots are completed after five years, at which time the crews start again with the first 20 percent and repeat the cycle. Information from these inventories is used to produce estimates of forest area, timber volume and growth, and to study changes in forest health.

On private forested lands, landowners utilize information from forest inventories to develop landscape-scale strategies that help them actively carryout forest management. The Department of Conservation is assisting in these efforts by working to increase the current 5 percent of Missouri's forested landscapes managed for the long-term sustainability of wood



products and critical habitats to 10 percent. Landowner Forest Stewardship Plans help accomplish these efforts. In fiscal year 2004, 160 of these plans were developed, resulting in an additional 29,000 acres under total resource management. This brings the total number of acres of privately owned forested land in Missouri incorporating total resource management to approximately 1.5 million.

The Department of Conservation is also implementing landscape-scale management through the Missouri Ozark Forest Ecosystem Project (MOFEP). Taking place on selected sites in Shannon, Carter and Reynolds counties, this project is looking at the effects of forest management practices on plants and animals. Some of the environment and vegetation projects examine genetic variation in plants, the size and species of ground flora and woody plants, soil carbon, lichens and fungi. Wildlife studies have looked at amphibians, reptiles, insects, small mammals and bird communities. Forest management information is coming from studies of tree harvesting, regeneration from stump sprouts and secondary effects of timber harvest. Landscape-scale management practices, such as those being researched through the MOFEP, provide long-term benefits to the entire forest community. For information about this research project visit <http://mofep.conservation.state.mo.us>

Forest management is a long-term proposition. Planning and investing today will affect the overall forest conditions 100 years from now. Sustaining healthy forest ecosystems will ensure that public needs and expectations will be met for generations to come.

Instructional Ideas

- Research and write a report that describes the causes and effects of oak decline, red oak borer, gypsy moth and other forest health issues. Identify where these problems are prevalent in Missouri and the United States.
- Develop a display or presentation highlighting Missouri forest products.
- Write a forest management plan for your school or a local park.

Timber Products

Missouri is one of the nation's top leaders in lumber production. Everything from pallets to Christmas trees comes from Missouri's forests. With over 450 primary wood product producers in the state, Missouri boasts a diverse array of forest-related products that add to the quality of our lives. These products include furniture and flooring lumber, oak and walnut veneer, tool handles, gunstocks, fence posts and furniture and cabinets, just to name a few. Charcoal barrels, walnut nutmeats, walnut shell products and red cedar gift items also come from the state's forests.

In 2002 Missouri's wood-using mills processed 140.5 million cubic feet of wood. Most of the wood came from Missouri's forests, with only 6 percent coming from other states. The eastern Ozarks region of the state (including Bollinger, Butler, Carter, Crawford, Dent, Iron, Madison, Oregon, Reynolds, Ripley, St. Francis, Shannon, Washington and Wayne counties) accounted for more than half of the total.

Information on timber product output is assessed every three years. This data is collected by foresters who visit all of the state's mills and survey owners and operators on volume of wood used, preferred species, where the mill buys the timber, and the previous year's production.

Information from production surveys, combined with monitoring results from the inventory plots, is used by foresters to determine whether the level of harvest can be sustained, while also maintaining healthy forests. Currently Missouri's forests are growing at a rate of at least 267 million cubic feet per year, so the harvest of 140.5 million cubic feet is easily sustainable. However, foresters and analysts will have to keep a close eye on which species, which tree sizes and which regions the growth and harvesting impact.

Instructional Ideas

- Develop a display or presentation highlighting Missouri forest products.
- Select an item that is a product of a forest ecosystem. Identify the steps necessary to produce the finished product from its natural resources and the steps necessary to recycle it back to nature or into a new product. Identify the steps where energy was used to manufacture or transport the product or its raw materials. The steps can be drawn and labeled in a "cycle of life" diagram.

Get Connected

—Forestkeepers Network

The best classroom activities sharpen students' skills, help them make connections across the curriculum and engage in real-world problem solving. Missouri Forestkeepers Network activities meet these criteria for instructional excellence. They challenge your students' science, math, natural history and observation skills while giving them the chance to improve the health of Missouri's forests.

Forestkeepers is Missouri's citizen forest-health monitoring program. It provides a statewide network for people to learn about forest health and contribute to the conservation of the state's forests. Open to individuals, youth groups, classrooms, families and forest landowners, volunteers in this program select a plot of trees to monitor and measure at least once a year. The plots are located on private woodlots, publicly owned forests, schoolyards, and city parks and along streets. Volunteers also help with the annual gypsy moth survey by setting and monitoring gypsy moth traps.

Enrollees receive a starter kit that includes the tools and information necessary for them to conduct their annual observations. A stick-on Biltmore scale provides information to identify and measure the diameter of the trees on their plot. A manual with illustrations helps identify crown dieback, leaf defoliators and other signs of forest health problems. A record sheet helps volunteers record all their observations.

Forestkeepers activities are a natural fit for the classroom, and the variety of activities supports the Show-Me Standards. For more information on how to get involved in promoting forest health, visit the Forestkeepers web site listed in the Web Resources section on page 12.



Protecting and Restoring Natural Diversity

Missouri is home to a diverse array of plants, animals and natural communities. More than 5,000 species of plants and at least 20,000 animal species occur in almost 200 recognized natural communities. The state's plant and animals include species from adjacent biomes as well as species and communities found only in Missouri.

The habitat of many of Missouri's species is shrinking, declining in quality or has become endangered. Over the centuries, our human tendency has been to plow up prairies, clear forests, drain wetlands and pollute streams—practices that have driven many species into extinction and sometimes destroyed entire natural communities. Currently, more than 600 kinds of plants and 325 different animals in Missouri are of concern to conservationists because they are uncommon or because their numbers are low or declining. These species of conservation concern ("rare" and "endangered") represent 18 percent of our native vascular plants and 28 percent of our vertebrate animals. Of these, nine plants and 21 animals are included on the federal endangered species list.

Clearly, Missouri's species of concern need protection and their habitat areas need to be protected or restored. Because protecting and restoring our state's natural diversity is a big part of the Department of Conservation's mission, we work with many others and employ several techniques to achieve this complex goal.

For example, we are conducting surveys of endangered birds, such as least terns; endangered plants, such as running buffalo clover; and endangered fish, such as the Ozark cavefish and Topeka shiners. We are also studying the impact of pesticides on endangered bats. One way we protect endangered bats and their critical cave habitat is by installing gates across cave openings. Vandal-proof gates keep trespassers out, but let bats pass through freely. Information about Missouri's species of concern and what is being done to protect them can be found at the Department's web site listed in the Web Resources section on page 12.

In a larger effort to protect and restore the state's biodiversity, the Department is taking an ecosystem approach, which emphasizes resource planning at a regional or landscape scale. This comprehensive effort includes restoration and management of native plants, animals and natural communities. To support this approach, the Department of Conservation is expanding the Missouri Natural Areas System.

Initiated in 1970, the Missouri Natural Areas System preserves some of the best examples of Missouri's great variety of natural terrestrial and aquatic communities and geological features. These areas also provide essential habitats for threatened plants and animals. Today the system consists of more than 181 areas and totals 60,075 acres. The areas range in size from one acre to 5,387 acres and are distributed among 74 of the state's 114 counties. The system includes caves that provide habitat for endangered bats and prairie grassland reserves for our last flocks of greater prairie-chickens. Sandstone canyons—where orchids, ferns and relict plants of Missouri's ice age grow—and glades that are home for desert-like plants and animals, such



as prickly pear cactus, tarantulas and scorpions, are also part of the system. Descriptions and locations of Missouri's natural areas can be found on the Department's web site at the link listed in the Web Resources section on page 12.

Some of these natural areas are scenic and accessible. Others are remote and must be located on foot with map and compass. Some areas can withstand considerable human traffic without harm. Others can be harmed easily by overuse. Management of these natural areas involves inviting public use without damage to the area. Management also includes restoring the natural processes (such as fire, under which the native plants and animals developed) and eliminating invasive species that compete with the native vegetation.

While they help the Department achieve its goal of protecting and restoring the state's natural diversity, our forests, prairies and other natural areas have benefits and values beyond providing places for our wild species to live. Natural areas can be valuable as outdoor classrooms, settings for nature interpretation activities and places for individual nature study and appreciation. They also provide recreational opportunities, help clean the water and the air, and improve the quality of life for people of all ages.

Instructional Ideas

- Conduct a habitat restoration project at your school or in your local community.
- Develop and conduct a population survey or monitoring program at a natural area in your community.
- Plan and develop an outdoor classroom emphasizing wildlife habitat at your school.

Get Connected

—Grow Native!

Every new real estate development contributes to the loss of wildlife habitat. A wisely planted landscape, however, has much to offer to displaced wildlife. Grow Native!, a joint program of the Missouri Departments of Conservation and Agriculture, helps people plan wildlife-friendly landscapes.

Small areas, such as backyards and schoolyard corners, can provide the perfect setting for wildlife-friendly landscapes. With a basic understanding of food and shelter needs, you can create habitat in just about any area. A hummingbird haven, for instance, fits into a space as small as 4-by-8 feet or even the area around a mailbox. The secret is to select plants that have masses of nectar-producing plants. Plans and plant lists for wildlife-friendly habitats, such as a butterfly berm, hummingbird haven, frog pond, prairie parcel, finch feast or chipmunk hideout, are available on the Grow Native! web site (see page 12).

The plants on these lists are Missouri natives, which provide the best wildlife habitat. By using native plants, gardeners mimic indigenous plant communities—those with which our native wildlife evolved over the last 10,000 years. Missouri's native plants thrive despite tough weather, including drought, insect infestations and subzero temperatures. Their resilience makes them hardy choices for yards and gardens.

Planning a native-plant garden begins with an inventory of your site. Use the Grow Native! web site to find the plants that suit your location. And if you're tempted to plant a non-native species, use the web site to find a native alternative.

Whatever type of area you have—big or small, sunny or shady—you can use native plants to transform it into wildlife habitat. At the same time you will be helping to preserve Missouri's natural diversity.

Instructional Idea

- Design a habitat for your schoolyard. Research the food and habitat needs of wildlife you would like to attract, starting with birds and butterflies. Use the Grow Native! web site to find native plants that meet those food and habitat needs.

Get Connected

—Outdoor Classrooms

Have you noticed how excited students get about learning when they're outdoors? The Missouri Department of Conservation can help you turn your schoolyard into an outdoor learning laboratory. Outdoor Classroom Grants are available in amounts up to \$1,000 to schools interested in developing or enhancing outdoor learning areas.

Outdoor classrooms can include prairie plantings, butterfly and hummingbird gardens, native tree and shrub plantings, small ponds or wetlands, wildlife shelters, trails and other components that support wildlife habitat and enhance active learning about natural resources.

These outdoor learning laboratories can supplement learning across all disciplines. For example, math students can calculate the area of the habitat and graph growth rates of plants. Social studies students can research Native American culture and the medicinal and food use of plants in the outdoor classroom. Combining art and language arts, students can develop an identification guide or interpretive signage for the site. Science can be a daily focus in the outdoor classroom with the study of ecological concepts, life cycles, plant and animal identification, the effects of weather on habitat and much more.

The first step in getting your outdoor classroom started is to identify the learning objectives you want to accomplish. Then assess your school grounds to see what features already exist and what can be added. Your local conservation education consultant is available to help you with this process. Your consultant can also provide assistance with a grant application. The Department's education consultants can be contacted through the regional offices listed on page 15.

The Department sends outdoor classroom grant application packets to schools in September. Applications are due in March, and grants are awarded in May. You can also access grant information on the Department's web site through the link listed under Web Resources on page 12.

An outdoor classroom can help you create an environment that shows every student his or her importance in conserving, restoring and protecting the environment. Get started on your outdoor classroom today!



Invitation to the Outdoors

One of the more visible ways that Missourians and their communities can become connected to conservation is through the Department of Conservation's outdoor areas.

Nearly two-thirds of Missourians live in metropolitan areas. These areas offer housing, employment, services and recreation to meet the needs of most of their urban/suburban residents. However, along with the urban lifestyle comes isolation from many aspects of nature. Reduced leisure time results in fewer trips to rural areas for outdoor activities.

Several studies have shown that, although Americans may participate in a wide range of outdoor activities, participation in many of those activities is decreasing. This decline is particularly apparent among youth and is increasing faster for youth than for any other age group. One study reports that "Four in 10 young adults are likely to engage in recreation either less than monthly or never."

Conservation Department personnel predicted these trends long ago. Since its beginning in 1937, the Department has recognized that helping all Missourians maintain a vital connection with nature is a big part of its conservation mission. A key element to conservation is public use.

To help Missourians stay connected to conservation, the Conservation Department manages over 900,000 acres of land, thousands of miles of rivers and streams and 610 lakes for people to explore.

Community Fishing Opportunities

The Community Assistance Program (CAP) is a long-standing and increasingly popular program. Started in the 1970s as the Community Lakes Program, it offered Missouri towns an excellent opportunity to acquire a lake at no expense to their residents. The Department acquired property on which they built, stocked and managed lakes suitable for fishing and boating activities, while encouraging community members to develop picnic areas. In 1980, the Community Lakes Program evolved into CAP. Through CAP and the closely related Corporate and Agency Partnership Program (CAPP), the Conservation Department enters into long-term agreements with cities, counties, state and federal agencies, businesses and schools. These agreements call for the Department to provide fisheries management at existing lakes and ponds and, in cooperation with the partners, to develop and maintain the facilities for anglers and boaters.

The Department stocks fish, manages habitat, sets fishing regulations and arranges most of the funding for developing the facilities. In return, the partners help with development; allow free public use of the area for fishing, boating and other recreation; and provide routine maintenance and law enforcement.

Over 70 communities take part in the program, which currently includes 41 stream access areas and more than 130 lakes, totaling more than 9,000 acres.

River Access Areas

The Department has created and maintains over 350 access sites on the state's rivers to allow easy access to the water, both for launching boats and for bank fishing. In response to national attention the Missouri River received during the Lewis and Clark Bicentennial, the Community Assistance Program helped develop several access sites in the Kansas City area, including LaBenite Park, Riverfront Park and Fort Osage. Community Assistance Program efforts also completed Stump Island Access in central Missouri. In addition, CAP advanced the progress on access projects in Lexington, Parkville and on Pelican Island near St. Louis. Many of the new accesses provide amenities for people with disabilities, including wheelchair-accessible boat ramps and restroom facilities and handicapped-accessible parking.

Conservation Areas

Many Missourians are avid wildlife watchers. Exceeding 1.8 million people, resident wildlife watchers spend more than 10 million days in the field, while nonresidents clock in at more than one and one-half million days. Wildlife activities in Missouri support more than 13,000 jobs each year.

In support of this citizenry, the Department has established many conservation areas and facilities that are within easy reach of both urban and rural areas. Conservation areas serve as sites for low-impact recreation and can be used as outdoor classrooms. The Department maintains boardwalks and viewing towers at some sites, which provide great access for observing migratory birds and other wildlife.

The Fountain Grove Conservation Area near Sumner supports migrating ducks, geese, shorebirds and pelicans. The Paul and Ruth Henning Conservation Area near Branson provides opportunities to see glades of wildflowers in the spring, while the trails at Shepherd of the Hills Hatchery allow visitors to observe trout, waterfowl and raptors. Guests at August A. Busch Memorial Conservation Area near St. Charles can observe deer and songbirds. Conservation areas are good examples of proper stewardship and resource management.

Nature Trails

Conservation lands are home to numerous hiking trails that serve as pathways to nature. Some trails are rugged, while others are paved and suitable for use by visitors with disabilities. The Osage Bluff Scenic Hiking Trail at Painted Rock Conservation Area in Osage County runs along high river bluffs and through an oak-hickory-sugar maple forest. The Savanna Ridge Hiking Trail at the Springfield Conservation Nature Center crosses a woodland and a restored open savanna, home to native prairie plants such as big bluestem, coneflowers and blazing star. The Spout Spring Hollow Nature Trail at Caney Mountain Conservation Area in Ozark County passes through one of the largest stands of old-growth forest in the White River country.

Trails provide access to conservation areas as well as recreational and educational opportunities. Foot traffic is allowed on all designated trails. Bicycling and horseback-riding are permitted on some trails.

Education and Nature Centers

Missouri's education and nature centers offer modern exhibits on nature and the environment. Visitors can connect with nature in a variety of ways, including walking on interpretive trails, observing live wildlife exhibits and attending workshops or classes covering a wide range of conservation-related topics. Students and scout groups delight in seeing live river otters; reptiles, such as snakes; and raptors, such as eagles and hawks.

Nature centers are located in St. Louis, Blue Springs, Springfield and Jefferson City. Each center conducts about 800 heavily-attended nature programs per year. Those centers, along with the new Discovery Center in Kansas City, host more than 800,000 visitors each year. Currently a conservation campus is being planned for Cape Girardeau.

Instructional Ideas

- Using the student worksheet on page 10, analyze how your students, your class and your school are "connected to conservation."
- Choose a local body of water, such as a reservoir, park lake or stream, which you think might be a good candidate for the Community Assistance Program. Develop a proposal that you might present to the Department of Conservation, detailing what the benefits would be to your community and what you would be willing to contribute to the project to see it happen.
- Using the online Conservation Atlas, research a conservation area in your county. Write a report that describes the size and predominant land cover of the area and the activities that are available there.
- Choose two conservation areas in your region and write a paper that compares and contrasts the features of each.
- Research conservation areas that have viewing towers and plot them on map of Missouri.
- Develop a class presentation that describes two nature trails in your county or region. Include the size and predominant land cover of the area, the length of the trails and the activities that are available there. Include a poster-sized map of the trails in your presentation.
- Contact the nature center closest to you and request a copy of their upcoming programs. If possible, plan a class field trip and write a report about what you found most exciting or interesting during the trip.
- Contact the nature center closest to you and request a copy of their upcoming programs. Plan a trip to a program of interest with family members or a group of friends. Make a presentation to the class detailing your visit.



How Are YOU Connected to Conservation?

Suggested use for the student worksheet on page 10

1. Have each of your students fill out the questionnaire, rank order his/her results and report back to the class on the top three to five activities that he or she engaged in over the past year and with whom.
2. Divide students into small groups and have them compile their data and report their group results back to the class.
3. Compile all the data into a class profile, using colorful charts and/or graphs, as appropriate.

Additional ideas

1. Have students use the questionnaire with other classes in the school and then compile a school profile, using colorful charts and/or graphs.
2. Have some students use the questionnaire with a group of adults or with extended family members and report back to the class.
3. Have some students use the questionnaire with a group of elementary school students and present a report of the results to the class. (Depending on the age of the elementary students, the questionnaire might need to be adapted.)

Get Connected

—No MOre Trash!

Missouri has spent millions of dollars cleaning up trash. The Conservation Department spends over \$140,000 battling trash each year, including cleaning up river accesses and conservation area parking lots. The Missouri Department of Transportation spends more than \$6 million each year on roadside cleanup.

To help solve this persistent problem, the Departments of Transportation and Conservation teamed up to launch a volunteer litter patrol and prevention program titled No MOre Trash! During last year's No MOre Trash! week, from May 1 through May 9, more than 500 groups and 4000 individuals picked up more than 13,500 bags of trash, as well as truckloads of tire treads and items too big to fit into trash bags. This year's campaign has the potential to be bigger and better! The first month-long No MOre Trash! Bash is scheduled for April 2005. During this full month bash, school groups and other volunteers are encouraged to get out and do their part to really make an impact. The Departments will recognize participants who report their activities with their own collectible No MOre Trash! Bash 2005 pin. To find out more about how to report your group's activities, visit the No MOre Trash! site listed in the Web Resources section on page 12.

Other No More Trash! initiatives include a video contest and a Monofilament Recycling Program. To compete in the video contest, youth ages 16-22 create a 30-second video ad designed to convince their peers to stop littering. The very best ads will receive a \$200 award and will be used to help raise anti-litter awareness. The video ad contest will be an ongoing competition, with awards made quarterly.

The new Monofilament Recycling Program is intended to recover and recycle plastic fishing line which, when discarded, can easily become hazardous to birds and animals. Monofilament recycling containers can be found at boat ramps, piers, parks, tackle shops and marinas.

For more information about litter prevention, visit the No MOre Trash! web site.

Instructional Ideas

- Conduct a survey that assesses current community activities to manage solid waste and litter.
- Identify "transition points" in the neighborhood or near the school that need more trash receptacles. Transition points are defined as those places where people move from outdoors to in, such as building entrances and bus stops. Start a campaign to add more receptacles where needed.
- Create a certificate or patch program in which students earn points by completing a series of activities related to litter prevention.

Get Connected

—Adopt-A-Trail

Without good hiking trails, we couldn't access the remote (and often most exciting) parts of our conservation areas. However, it takes a lot of time and energy to maintain good trails. The Missouri Department of Conservation's volunteer program, Adopt-A-Trail, provides opportunities for Missourians of all ages to monitor, maintain and enhance Missouri's 676 miles of conservation area trails and trailhead facilities.

School and youth groups, as well as organizations, businesses, families or individuals, can adopt a conservation area trail. Anyone with an interest in trails and the outdoors is welcome to help preserve our land and provide safe, enjoyable access to the outdoors. Adopt-A-Trail volunteers assist conservation area staff in managing and maintaining trail systems. Activities include keeping trail surfaces free of sticks, rocks and other debris; pruning small limbs from the trail corridor; cleaning waterbars and drainage ditches; and clearing debris from bridges, stairs and viewing decks.

School groups can help with litter cleanup; maintenance of the trailhead area, including parking lots, bulletin boards and trail signs; and reporting vandalism, trail hazards or safety issues. Depending on students' interests and abilities, school groups might want to take part in building benches, repairing trail structures, or helping with environmental restoration work. Adopt-A-Trail provides an opportunity for youth to be actively involved in conservation. Helping to maintain and enhance existing trails improves the resource for all to enjoy. If you have questions or would like more information on the requirements of volunteering, visit the Adopt-A-Trail web page listed on page 12.

Instructional Ideas

- Locate and visit a hiking trail near your home. Draw a map of the trail. Identify and label the areas along the trail that need maintenance and describe the types of activities that you could do to help maintain those areas.
- Organize an Adopt-A-Trail team at your school.
- Develop and implement a program similar to Adopt-A-Trail for an area on or near your school grounds.

How are YOU Connected to Conservation?

Student Worksheet

Recent survey results indicate that four in ten young adults “are likely to engage in recreation either less than monthly or never.” Is that assessment true of you? Of your classmates? Of your school?

Directions: Check the frequency with which you engaged in the following activities **during the past 12 months** and indicate whether you did the activity alone, with friends or with family. This will give you an idea of how connected you are to outdoor Missouri.

Activity	Frequency				With whom?		
	0	1-6	7-12	12+	Alone	With friends	With family
Archery							
Backpacking							
Bicycling							
Birdfeeding							
Birdwatching							
Camping							
Canoeing/Boating							
Cleaning Up Trash							
Fishing							
Gardening							
Hiking a Nature Trail							
Hunting							
Tree Planting							
Target Shooting							
Visiting a Conservation Area							
Visiting a Nature Center							
Volunteering—Conservation Group							
Volunteering—Environmental Group							
Walking Outdoors in a Natural Area							

What do you know about these programs?

Program	Never heard of	Know name	Know what program does	Have participated
Adopt-A-Trail				
Forestkeepers				
Grow Native!				
No MOre Trash!				
Stream Teams				

Protecting Watersheds

The health of Missouri's aquatic and terrestrial habitats is heavily dependent on the health of watersheds. In particular, watershed erosion and runoff from poorly managed lands leads to water quality and sedimentation problems downslope and downstream. Both of these conditions cause the degradation of stream and riparian animal habitats and communities.

This is especially true in urban areas. When development occurs, the resulting alteration to the land can lead to dramatic changes in the hydrology, or the way water is transported and stored. Development generally brings an increase in impervious surfaces such as parking lots, roads, roofs, compacted soils or any surface that prevents the natural penetration of rainfall into the ground. Impervious surfaces and compacted soil increase runoff and decrease groundwater infiltration. As more runoff gushes into streams, over land or through stormwater systems, streams become deeper, wider and straighter. This rapid flush of water tears away streamside vegetation, fills important habitat with sediment and causes extreme temperature fluctuations.

The loss of fish, wildlife and forest resources due to urban development is a widespread and growing concern. Good land management on a landscape level is essential for healthy aquatic habitats and animals as well as wildlife habitat and forests. The lack of watershed management leads to the fragmentation of wildlife habitat, conversion of prairie and forests to non-native grasses and plants, and degraded water quality and fish habitat due to sedimentation.

To address the long-term, sustainable health of fish, forests and wildlife, a landscape-level planning approach in the watershed is needed. To meet this challenge, the Department of Conservation is focusing efforts on protecting, improving and maintaining priority watersheds across the state. One step in

this effort is assessments of current conditions in watersheds statewide. To date, inventories and assessments for 36 watersheds have been completed. Assessments include hydrological, physical and biotic descriptions as well as watershed-level land use practices and water quality concerns. Management goals, objectives and strategies are also summarized. This information can be accessed on the Department's web site at the location listed in the Web Resources section on page 12.

Students and citizens across the state are also helping to protect our watershed resources. Through the Stream Team program, volunteers have adopted more than 2,842 miles of urban streams. Along these stream miles, volunteers perform hands-on conservation activities, including water monitoring, tree planting, stabilizing stream banks and picking up litter.

The result of all of these efforts will be improved water quality and aquatic habitat in Missouri's lakes and streams. Wildlife habitat and forests in the terrestrial portion of the watershed will also benefit. Healthy watersheds benefit Missouri citizens as well.

Instructional Ideas

- Identify the types of non-point source and point source pollution in a local watershed.
- Develop a public awareness campaign to educate the community on watershed issues.
- Research city and county ordinances relating to development and determine if they are environmentally friendly.

Get Connected

—Stream Teams

The state of Missouri is rich in water resources, with over 56,000 miles of free-flowing streams. The health of these streams depends on community-based stewardship, and in 1988, the Department of Conservation helped launch the Stream Team program to provide it. Collectively, local Stream Team members learn to monitor water quality on a geographic scale far beyond what government agencies can do. They also work to plant trees, stabilize stream banks, and improve fish and wildlife habitats in or near streams. Currently the Department supports more than 2000 Stream Teams throughout the state. Did you know that 25 percent of these teams are made up of school groups? High school students in particular are perfectly suited for a full Stream Team experience.

One of the most popular activities is water-quality monitoring. The Stream Team program offers multiple levels of monitoring training. Teams can attend as much or as little of this training as they like and each group determines its level of involvement. Not all tests must be performed on each monitoring trip. Teams can determine how much they want to accomplish and select the activities necessary to meet their objectives.

The Missouri Departments of Conservation and Natural Resources maintain an extensive database of information that has been collected by Stream Team volunteers. This database is a key component in determining the health of Missouri streams. For example, when a fisheries biologist began finding problems with catfish populations in northwestern Missouri streams, the only water quality data available had been collected by Gallatin High School's Stream Team. These data were very important in validating water-quality conditions in the watershed.

It's easy to start a Stream Team at your school. Registration forms, program information and activity ideas can be found at the Stream Team web site listed in the Web Resources section on page 12 or by calling (800) 781-1989. Think about taking action to get your school group involved. They'll never look at streams the same way again!

Web Resources

Grow Native!

www.grownative.org

Provides individuals, organizations, schools and government agencies with information, education and training materials that help them discover and use native plants.

Keep America Beautiful

www.kab.org

Educator link to curriculum guides and teacher training materials on the fundamentals of litter prevention; preserving our resources; responsible solid waste management; and how to reduce, reuse and recycle.

Missouri Stream Team

www.mostreamteam.org

The source for information on how groups of volunteers have banded together to help improve some of Missouri's 56,000 miles of streams.

No M0re Trash!

www.nomoretrash.org

Information about Missouri's litter-prevention program and how schools and other groups can get involved.

The Missouri Forestkeepers Network

www.forestkeepers.org

Information on how educators and students can get involved in maintaining forest health.

MDC Links Referenced in this Publication

Adopt-A-Trail Program missouriconservation.org/trails/adopt.htm

Conservation Atlas missouriconservation.org/atlas

Species of Conservation Concern

missouriconservation.org/nathis/endangered

Missouri Web of Life missouriconservation.org/nathis/lifeweb

Natural Areas System missouriconservation.org/nathis/naturalareas

Outdoor Classrooms missouriconservation.org/teacher/outdoor

Watershed Inventories and Assessments

missouriconservation.org/fish/watershed

Publications

(May also be available via library loan or your local bookseller)

Field Manual for Water Quality Monitoring: An Environmental Education Program for Schools

Mitchell, Mark K., William B. Stapp and Kevin Bixby. This field manual details nine chemical/physical water quality tests and methods for biological monitoring. Material can be used with middle school through graduate students. ISBN: 0787268011, <www.amazon.com> (\$25.95)

The Trees in My Forest

Heinrich, Bernd. Creates detailed portraits of a forest's life giving readers the full view of life in a healthy forest ecosystem. Author has the ability to engage the reader instantly and to transform common settings into meaningful and educational experiences. ISBN: 0060929421, <www.amazon.com> (\$10.25)

Building a Backyard Bird Habitat

Shalaway, Scott. Practical and easy-to-follow information on how to create a backyard habitat that will attract a variety of birds throughout the year: cardinals, orioles, chickadees, woodpeckers, hummingbirds, bluebirds, goldfinches, and more. ISBN: 0811726983, <www.amazon.com> (\$11.50)

Attracting Birds, Butterflies, and Other Backyard Wildlife (National Wildlife Federation)

Mizejewski, David. A short guide to creating gardens and yards that promote ecological balance and provide natural habitats for a wide variety of wildlife – birds, butterflies, toads, snakes, bats, bees and necessary predators such as spiders, beetles, owls and hawks. ISBN: 1580111505, <www.amazon.com> (\$10.00)

The following publications are available from Acorn Publications, P.O. Box 2423, Tustin, Cal. 92781-2423, (800) 422-8886 or www.acornnaturalists.com.

Citizen Action: Teacher's Guide

World Resources Institute. Compact, idea-filled resource for introducing secondary students to positive projects that channel their energies and benefit the environment. #EE-7013 (\$9.95)

Environmental Action, Habitat and Biodiversity

E2: Environment & Education. This innovative curriculum offers 16 activities for studying biodiversity. Includes assessment techniques, resource listings and student masters. Teacher's Guide - #EE-6516 (\$16.95). Student Workbook - #EE-6517 (\$7.45)

Greening School Grounds, Creating Habitats for Learning

Grant, Littlejohn, Eds. This anthology includes step-by-step instructions on how to turn any space into a place of adventure and exploration. Includes projects, outdoor activities, curriculum ideas and lists of funding and training resources. #EE-9371 (\$16.95)

The Biodiversity Collection, A Review of Biodiversity Resources for Educators

World Wildlife Fund and North American Association for Environmental Education. A compendium of exemplary environmental education resources on biodiversity. #EE-6112 (\$11.95)

MDC Publications

Educational Resources

E00035	<i>Plants in Peril</i>
E00054	<i>The History of the Conservation Movement in Missouri</i>
E00127	<i>Forest Products</i> (poster)
E00135	<i>Ecological Approach to Conservation Education</i>
E00433	<i>Woodworking for Wildlife</i>
E00444	<i>Wildflower Favorites</i>
E00450	<i>Backyard Bird feeding</i>
E00454	<i>Landscaping for Backyard Wildlife</i>
E00471	<i>Butterfly Gardening and Conservation</i>
F00012	<i>Show Me trees</i> (poster)

Informational Brochures

F00016	<i>Missouri Forests</i>
F00056	<i>Threat of the Gypsy Moth</i>
F00129	<i>Oak Decline and the Future of Missouri's Trees</i>
FIS182	<i>Form a Missouri Stream Team</i>
M00222	<i>Missouri Outdoor Map</i>
SCI048	<i>Missouri Natural Communities: Prairie</i>
SCI049	<i>Missouri Natural Communities: Forest</i>
SCI050	<i>Missouri Natural Communities: Karst</i>
SCI075	<i>Protecting Endangered Species in Missouri</i>
W00014	<i>Natural Areas Brochure</i>

Media Loan

Back to the Wild

Upper Elementary-Adult/ 1997/ 30 minute video
Soar through the skies with giant Canada geese, leap through fields and woods with white-tailed deer and journey underwater with river otters and the magical paddlefish—an ancient survivor from the days of dinosaurs. "Back to the Wild" tells the incredible tale of the return of seven animals that had nearly vanished from Missouri.

Creating an Urban Oasis

Junior High- Adult/ 1992/ 20 minute video
Trees can make a big difference in city life. Keeping them thriving in an urban environment, though, can be a real challenge. Learn from a variety of Missourians what you can do to enhance trees in your town or city.

Exploring Outdoor Missouri

Adult/ 1996/ 26 minute video
Explore Missouri's scenic lands where a variety of recreational opportunities await. See great places to hunt, fish, hike, observe nature and more.

The Spirit of Conservation

Elementary-Adult/ 2001/ 27 minute video
Explore the history of the Conservation movement in Missouri. It's a story that still lives in the memories of the men and women who worked so hard to preserve our natural resources. Host Kipp Woods retraces the grassroots efforts and successes of conservation in Missouri since the early 1900s.

Wild in the City

High School-Adult/ 30 minute video
This video is filled with easy ways to create fragrant, colorful wildlife habitats so songbirds, hummingbirds, butterflies and others will find your yard irresistible. Plus there is an assortment of building plans for hands-on projects.

From the *Missouri Outdoors* TV Story Collection:

Wood/Forest Products I, II and III

A series of 40 minute videos covering such topics as: Missouri black walnuts, red cedar products, hickory handle making, white oak basketry and maple syrup tradition.

MISSOURI CONSERVATIONIST *Connections*

The *Missouri Conservationist* magazine provides a wealth of information about the forest, fish and wildlife resources of the state. Listed below are recent articles pertaining to management practices, community involvement and associated topics. These articles are available to view or print from the Department of Conservation web site at www.missouriconservation.org/conmag/archive.

"Putting Native Plants to Work," by Bonnie Chasteen, December 2004
These natural tools make your landscape beautiful, resilient, and useful to wildlife.

"Birding on Conservation Areas," by Jim Rathert, September 2004
Conservation areas attract wild birds, as well as those who love to watch them.

"Stash That Trash," by Chris Riggert, May 2004
Supplying mesh trash bags to canoeists is helping to keep Missouri's streams clean.

"No Muddy Waters for Stream Team," by Kathryn Buckstaff, March 2004
Reeds Spring High School students adopt a stream and a clean-water philosophy.

"Forests in a Looking Glass," by Keith Moser, January 2003
Compiling a century of data on our Ozark forests.

"It's a Natural," May 2002

Conservation nature centers serve as portals to Missouri's outdoors.

"Sustaining Missouri's Forests," by Bruce Palmer, September 2000
A civilization hinges on how it manages its forests.

"Twenty Years of Missouri Natural Areas: Protecting the Genuine Article"
by Richard Thom, March 1997
Natural areas become biological benchmarks.

These following *Outside In* articles are available to view or print from the Department web site at www.missouriconservation.org/kids/out-in/archive.

"Stream Dreams," by Margot McMillen, September 1997
The sky's the limit for this Raymondville Stream Team.

Project *Connections*

Activate your students to take part in making decisions that balance the needs of people and the management of natural resources with these interdisciplinary, hands-on, easy-to-use activities from Project Learning Tree and Project WILD. To receive these nationally acclaimed conservation education curriculum and activity guides, attend a training workshop in your area. For more information contact Syd Hime, Missouri Department of Conservation, P.O. 180, Jefferson City, MO 65102, (573)522-4115, ext. 3370, <syd.hime@mdc.mo.gov>.

Project WILD

Changing the Land—Simulate and explain how fragmentation of biological communities can affect wildlife diversity and populations; determine what factor influenced historical and current land-use decisions; evaluate the impacts of different land-uses and consider future land use.

Pay to Play—Distinguish between consumptive and nonconsumptive uses of wildlife; describe the sources of funding for wildlife areas; relate usage to increased financial demand on managed wildlife areas and describe the impact of increased human usage on wildlife habitat.

Aquatic WILD

Dragonfly Pond—Evaluate the effect of different kinds of land use on wetland habitats; discuss and evaluate lifestyle changes to minimize damaging effects on wetlands.

Watershed—Identify the characteristics of watersheds; discuss the role of watersheds in providing wildlife habitat as well as human habitats; give examples of watershed conservation.

Project Learning Tree

Forest Consequences—Evaluate the options for managing or using a piece of land; make a land-use decision and explore the consequences of that decision.

Forests for the Trees—Participate in a simulation designed to teach how forest resources are managed and simulate managing a piece of land for various products.

Saga of the Gypsy Moth – Forest Ecology Secondary Module

—Explore ecological and social issues related to the gypsy moth; consider strategies for management of the gypsy moth.

No MOre Trash! Bash

April 1-30, 2005

Join volunteers across the state in this month-long effort to clean-up Missouri by organizing a litter pick-up event. Participants who report their activities will be recognized with their own collectible No MOre Trash! Bash 2005 pin. For information and resources visit <www.nomoretrash.org>.

Outdoor Education Conference

April 22-24, 2005

Windermere Conference Center
Lake of the Ozarks, MO

Join the Conservation Department's Outreach and Education staff for a weekend of field and classroom activities that will increase your knowledge of conservation and enable you to include basic outdoor skills in just about any classroom subject. This conference is particularly beneficial to junior and senior high school educators and is free to non-credit-seeking participants. For registration information and to get a copy of the agenda, visit our web site at <www.missouriconservation.org/teacher>, contact Bryan Bethel at (573)522-4115, ext. 3364 or contact your local regional office.

Educator Workshops

A schedule of Education Workshops for 2005, covering various conservation education topics and taught by the Department's Conservation Education Coordinators, is included with this issue. For more detailed information about any of our credit or non-credit Teacher Education courses, visit our web site at <www.missouriconservation.org/teacher/workshops/workshops.html> or contact your local regional office.

Regional Offices

Central Office, Jefferson City	(573)751-4115
Central Regional Office	(573)882-8388
Kansas City Regional Office	(816)655-6254
Northeast Regional Office	(660)785-2424
Northwest Regional Office	(816)271-3111
Ozark Regional Office	(417)255-9561
Southeast Regional Office	(573)290-5730
Southwest Regional Office	(417)895-6881
St. Louis Regional Office	(636)300-1953

Conservation Careers

Outdoor Skills Specialist

As might seem apparent, an Outdoor Skills Specialist promotes and conducts a wide variety of outdoor skills programs, including the activities of canoeing, fishing, hiking, primitive camping, archery and backpacking. But there is much more to this job than you might think. Aside from teaching skills, part of the specialist's mission is to promote conservation issues and the wise and responsible use of resources. An important aspect of every outdoor skills program is emphasizing concepts such as safety and ethics.

As well as an avid interest in the outdoors, an Outdoor Skills specialist must have superior organization and time management skills. Specialists spend a great deal of time interacting with educators, school administrators, youth group leaders and scout organizations to develop and foster outdoor skills programs in the schools and communities they serve. They meet the need by developing and distributing publications that support their programs and by conducting clinics, workshops and seminars for both students and the adults who work with them. In many cases, the specialist needs to be a "visual" teacher to students who have no prior knowledge of the skill being taught.

In addition to their work with youth and school groups, specialists work side-by-side with others both inside and outside to the Conservation Department organization. Internally, specialists work with the Department's other resource divisions, such as wildlife and private land services, to enhance their Division messages. Externally, specialists partner with other organizations—such as sportsman's groups, local fishing and archery clubs, scout leaders and others—to get volunteer manpower support for a special activity, such as a Kid's Fishing Day at a community lake. Specialists work tirelessly to provide a host of opportunities for using the outdoors, both consumptively as in youth hunts and non-consumptively as in archery or camping trips.

Outdoor Skills Specialists with the Missouri Department of Conservation have graduated from an accredited college or university with a bachelor's degree in conservation education, physical education, biological sciences, agricultural science or curriculum development with a science background and have at least three years of professional teaching experience.



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If you would like to be removed from *The Conservation Resource* mailing list or would like to have the publication mailed to a different address, please fill out the form, clip and mail to the address below. This form can also be found and submitted online at www.missouriconservation.org/teacher/.

Carol Harris
Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65102-0180

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The Conservation Resource is published three times a year—fall, winter and spring—by the Missouri Department of Conservation Outreach and Education Division. Its purpose is to provide current information on conservation topics and resources for integrating those topics into instructional lessons.

Write to us for a free subscription:
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Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65102-0180

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